

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Status of the claims:

Claims 1 - 18, 39, 42 and 51 are cancelled without prejudice or disclaimer. Claims 19, 21, 30 and 44 are amended to include the subject matter of their parent and any intervening claims. Claims 38 and 46 are amended to overcome the 35 U.S.C. § 112 rejection. No new matter has been added. Claims 19 - 38, 40 - 41, 43 - 50, 52 - 54 are currently pending for consideration.

Allowable Subject Matter:

Applicant expresses appreciation to the Examiner for the indication that claims 21, 30 - 32, 37, 39 - 41 and 44 would be allowable if rewritten in independent form including all the features of the base claims and any intervening claims.

The subject matter of original base claim 19 and intervening claim 20 is included in currently amended independent claim 21. Therefore independent claim 21 is believed to be allowable. Because it depends from independent claim 21, dependent claim 37 is believed to be allowable for at least the same reasons independent claim 21 is believed to be allowable.

In addition, the subject matter of original claim base 27 is included in currently amended independent claim 30. No claims were intervening between claims 30 and 27. Therefore independent claim 30 is believed to be allowable. Because they depend from independent claim 30, dependent claims 31 and 32 are believed to be allowable for at least the same reasons independent claim 30 is believed to be allowable.

The Examiner indicated that dependent claim 39 would be allowable if rewritten in independent form including all the features of the base claims and any intervening claims. Claim

39 was directly dependent from independent claim 19. By the present Amendment, the subject matter of allowable original claim 39 is included in currently amended independent claim 19. Therefore independent claim 19 is believed to be allowable at least for reasons that claim 39 was found allowable. Because they depend (directly or indirectly) from independent claim 19, dependent claims 20, 22-26, 41 and 43 are believed to be allowable for at least the same reasons independent claim 19 is believed to be allowable.

Accordingly, the subject matter of original claim 19 and intervening claim 43 is included in currently amended independent claim 44. Therefore independent claim 44 is believed to be allowable.

Claim Rejections - 35 U.S.C. §112

The Office Action of April 25, 2007 rejects Claim 38 and its dependent claims 50, 52-54, and claim 46 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner stated that the limitation “an electrode contacting the pinned layer” is not clear from the Figures or written description of the present application. The Examiner acknowledged that the specification refers to the electrode 44 as being on top of a pinned layer. Therefore, claims are amended accordingly.

In particular, claims 38 and 46 are amended to recite “the pinned layer is on top of the electrode.” The claim amended is supported by the original specification on page 13 lines 5-20. Thus no new matter is added.

Claims 38 and 46 are therefore, in compliance with the requirements of 35 U.S.C. § 112.

Claim Rejection – 35 U.S.C. §103

Claims 19 - 20, 22 - 26 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mack et al. (US Pat. No. 6,462,919 B1) in view of Fontana, Jr. et al. (US Pat. No. 6,680,832 B2).

Claims 19 has been amended to include the features of previously objected claim 39 (which recites that the separated regions of patterned exchange bias material are located between the free layer and an electrode) or features specifying that the separated regions of patterned exchange bias material are located between the free layer and a shield layer (consistent with the embodiment of Fig. 19).

The Examiner indicated that dependent claim 39 would be allowable if rewritten in independent form including all the features of the base claims and any intervening claims. Claim 39 was directly dependent from independent claim 19. Accordingly, by the present Amendment, the subject matter of original claim 39 is included as one alternative arrangement in currently amended independent claim 19. As noted above, claim 19 is further amended to include a second alternative arrangement that the separated regions of patterned exchange bias material are located between the free layer and a shield layer. It is submitted that the prior art of record does not describe or suggest a configuration as defined by either arrangement defined in claim 19. Therefore independent claim 19 is believed to be allowable. Because they depend (directly or indirectly) from independent claim 19, dependent claims 20, 22-26, 41 and 43 are believed to be allowable for at least the same reasons independent claim 19 is believed to be allowable.

Claims 27 - 29, 33 - 36, 38, 45, 47 - 49, 50 and 52 - 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seyama et al. (US Pat. No. 6,801,413 B2) in view of Fontana, Jr. et al. (US Pat. No. 6,680,832 B2).

Claim 27 is directed to a read head that comprises, a GMR spin valve stack including at least a pinned layer and a free layer; a first shield disposed at a first end of the GMR spin valve stack and a second shield disposed at a second end of the GMR spin valve stack, where the second shield is formed to include integral side shields that extend toward the first shield; and an insulated layer of permanent magnet material disposed between the shields and abutting the free layer, wherein the integral side shields of the second shield extend beyond at least a portion of the insulated layer of permanent magnet material.

Figure 8 of the present application shows an example of a read head in which a GMR spin valve stack having a pinned layer 126 and a free layer 128 has a first shield 122 disposed at a first end and a second shield disposed at a second end. The second shield includes integral side shields 140, 142 that extend toward the first shield 122. An insulated layer of permanent magnet material 132, 134, 136 is disposed between the shields and abuts the free layer 128. The integral side shields 140, 142 extend beyond at least a portion of the insulated layer of permanent magnet material.

In claim 27, the second shield includes integral side shields that extend toward the first shield, and beyond at least a portion of the insulated layer of permanent magnet material. One following the teachings of Fontana et al. and Seyama et al. would not be led to such a structure, but rather would be led away from such a structure. In particular, the shield structure described by Seyama et al. does not include side shields (and does not have integral side shields that extend toward the first shield beyond at least a portion of an insulating layer of permanent magnet material). Moreover, Seyama et al. could not have such a structure, due to the presence of the "hard layer 56." More specifically, Seyama et al. teach to form a "hard layer 56" on each end of the dual spin valve layer 23, to act as a magnetic domain control layer. Seyama et al.'s "hard layer 56" is composed of multiple, alternating layers of permanent magnet material 58 and SiO₂ material 57. The alternating layers 57 and 58 (of the hard layer 56) are formed on each side of the dual spin valve layer 23 and directly below the shield electrode 26. (Seyama, et al., col. 10, ll. 64-66 and col. 11, ll. 4-20 and Figs. 13A and 13B.)

Indeed, with reference to Figs. 13A and 13B of the Seyama et al. patent, the presence of Seyama et al.'s layers of permanent magnet material 58 and SiO₂ material 57 of hard layer 26 on each side of the dual spin valve layer 23 (and directly below the shield electrode 26) would preclude one from forming integral side shields on the shield layer 26 and extending those side shields toward the shield. One could not extend Seyama et al.'s shield layer 26 toward the shield layer 22, without destroying the structure and function of the layers of permanent magnet

material 58 and SiO₂ material in Seyama et al.'s hard layer (i.e., without destroying the structure and intended function of Seyama et al.'s head).

The Examiner acknowledged that Seyama et al. is silent regarding the second shield being formed to include integral side shields that extend toward the first shield, wherein the integral side shields extend beyond at least a portion of the insulated layer of permanent magnet material. (Office Action, pg. 7, ll. 19-22.) However, the Examiner stated that Fontana, Jr. et al. show a second shield 13 as including integral side shields 15 and 17 that substantially enclose the GMR spin valve stack between the pair of shields. The Examiner further argued that it would have been obvious to one of ordinary skill in the art at the time of the invention to form one of the shields of Seyama et al. to include integral side shields that substantially enclose the GMR spin valve stack. (Office Action, pg. 8, ll. 5-16.)

However, as noted above, Seyama et al. requires a hard layer 56 composed of alternating layers of permanent magnet material 58 and SiO₂ material 57 to be arranged adjacent and abutting either side of the spin valve layer 23, to act as a magnetic domain control layer. One could not extend Seyama et al.'s shield layer 26 toward the shield layer 22, without destroying the structure and function of the layers of permanent magnet material 58 and SiO₂ material in Seyama et al.'s hard layer 56 (i.e., without destroying the structure and intended function of Seyama et al.'s head).

Neither Seyama et al. nor Fontana, Jr. et al., disclose or suggest any manner in which Fontana, Jr. et al.'s side shields could be incorporated into Seyama et al.'s structure without somehow making a wholesale re-design or reconfiguration of Seyama et al.'s structure, including the alternating layers of permanent magnet material 58 and SiO₂ material 57. In contrast, the present application describes the formation of a gap layer with angled ramp portions on either side of the stack of layers 44-52, to allow contact between a permanent magnet layer and the stack of layers 44-52, while still allowing integral side shields to extend from the second shield toward a first shield and beyond at least a portion of the permanent magnet material. (e.g., See Figs. 5-10 of the present application.) One of ordinary skill in the art would not have come to the

inventive structure disclosed and claimed in the present application, from the Seyama et al. and Fontana, Jr. et al. references. Therefore the structure of claim 27 is patentably distinguished over the Seyama et al. and Fontana, Jr. et al. references. Furthermore, it would not have been obvious or practical to make a combination of the Seyama et al. and Fontana, Jr. et al. references as suggested by the Examiner.

Improper Combination under 35 U.S.C. 103 (a)

The combination of Fontana, Jr. et al.'s shields with Seyama et al.'s structure, as suggested by the Examiner, is respectfully traversed. As discussed above, one could not extend Seyama et al.'s shield layer 26 toward the shield layer 22, without destroying the structure and function of the layers of permanent magnet material 58 and SiO₂ material in Seyama et al.'s hard layer 56 (i.e., without destroying the structure and intended function of Seyama et al.'s head). It is a well settled principle of patent law that prior art likely teaches away from a combination, if the combination would destroy the function of the prior art.

As recited in Ex parte Hartmann 186 U.S.P.Q. 366, 376 (PTO Bd. App. 1974) (See also Ex Parte Blackie, 189 U.S.P.Q. 318 (PTO Bd. App. 1974):

Reynolds teaches neither partial nor complete orientation of filaments in the film matrix. *More importantly however, Reynolds cannot properly be combined with Graham et al. relative to the employment of continuous monofilaments, since to do so would destroy that on which the invention of Graham et al. is based, namely, the use of very short fibers.*

In addition to teaching away from the combination suggested by the Examiner due to the resulting destruction of the functionality of Seyama, et al.'s structure, it is noted that in Fontana, Jr., et al., there is no insulated layer of permanent magnet material. Instead Fontana et al. (Fig. 2) shows biasing layer 44, the operation of which would be disrupted by a permanent magnet material.

Therefore Seyama et al. cannot properly be combined with Fontana et al. since to do so would destroy that on which the patents to Seyama et al. and Fontana, Jr. et al. are based.

Therefore the structure of claim 27 is patentably distinguished over the Seyama et al. and Fontana, Jr. et al. references, alone or in the combination suggested by the Examiner.

As claims 28, 29, 33-36, 28, 45, 47-49, 50 and 52-54 are each dependent, directly or indirectly on claim 27, the rejection of those claims is also respectfully traversed at least for reasons discussed above with respect to claim 27 and further reasons apparent from the language of the dependent claims.

Conclusion:

In view of the foregoing, Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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